be set to be not more than half the density of the additive in the thick inside portion thereof. Due to this thin density of the additive, light emission materials such as halide can be suppressed from reacting with the additive and good discharge characteristic can be maintained.

According to a third aspect of the present invention, there is provided a ceramic envelopes according to the second aspect of the invention, wherein the additive includes at least one selected from a group consisting of Sc_2O_3, Mgo, ZrO_2, Y_2O_3 and a lanthanoid-based rare earth oxide.

By adding this additive, grains of the parent phase of ceramic represented by alumina are suppressed from abnormally growing, and thus uniform grain growth is induced. Moreover, the surface roughness Rmax is controlled to have an appropriate value.

Brief Description of the Drawings

FIGS. 1A and 1B are cross-sectional explanatory views showing one example of an embodiment of a ceramic envelope for a high intensity discharge lamp according to the present invention, where FIG. 1A is an overall view and FIG. 1B is a partially enlarged view;

FIG. 2 is a cross-sectional explanatory view showing another embodiment of the present invention;

FIG. 3 is a cross-sectional explanatory view showing yet another embodiment of the present invention;

FIG. 4 is a partially cross-sectional explanatory view showing yet another embodiment of the present invention; and

FIG. 5 is a cross-sectional explanatory view of a conventional ceramic lamp for a high intensity discharge lamp.

Description of the Preferred Embodiments

The embodiments of the present invention will be described hereinafter in detail with reference to the drawings.

FIG. 1 is a cross-sectional explanatory view showing one example of a ceramic envelope for a high intensity discharge lamp according to the present invention. The ceramic envelope includes a barrel section 1 which has a discharge space formed into an elliptic like shape with a diameter of central section widened. In addition, the ceramic envelope includes narrow-diameter capillary sections 2 serving as electrode insertion sections, which is formed by narrowing the right and left end portions of the barrel section 1. A rod-like current conductor (not shown) having a discharge electrode provided on a tip end is inserted and fixedly sealed into the capillary sections 2.

This ceramic envelope is molded from materials mainly containing alumina by adding MgO as an additive, for example. After being burned, the envelope has a light transmission property. The dimensions of the respective constituent elements will be shown by way of example. The outside diameter D1 of the barrel section 1 is 14.8 mm, the inside diameter D2 thereof is 13.0 mm, the length L1 thereof is 25.5 mm and the entire length L2 of light emission tubes is 55.7 mm. Also, the surface roughness Rmax of the inner surface of the envelope is set at 0.2 μm. Each of the inside boundary end portions 3 between